Hearing the music of others

Hearing the Music of Others: Pierre Schaeffer's Humanist Interdiscipline[1]

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Published in 1966 and revised in 1977, the *Traité des objets musicaux* (Treatise on musical objets) represents the culmination of Pierre Schaeffer's thinking on the nature of music and sound. Building upon more than a quarter century of broadcasting and compositional research, Schaeffer's book saw immediate adoption as a research guide by the composers and technicians of the Groupe de Recherches Musicales (GRM), the experimental broadcasting unit Schaeffer founded in 1958. It has since taken on a reputation as one of the canonical texts of the academic electroacoustic tradition as a whole. Now, a half century after its original publication, Schaeffer's finely wrought meta-language for the relationship between human listening and musical sound is finally beginning to appear in English translation.[2] The lack of translation until now, however, has not hampered the growth of a robust and independent anglophone tradition of Schaeffer scholarship. There is a particularly strong current of critical writing building upon Schaeffer's thinking about the affordances of an 'acousmatic' approach to sound, that is, when sound is encountered in the absence of a visible source.[3] With few exceptions, however, the focus has been upon putting Schaeffer's ideas to compositional work rather than their implications for the descriptive study of music more broadly. Historians have similarly treated Schaeffer's theoretical work as a footnote to his endeavours as a composer and engineer.[4] And yet these studies frequently invite us to think of

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2 Pierre Schaeffer, *In Search of a Concrete Music*, trans. John Dack and Christine North (Berkeley, 2012); Pierre Schaeffer, *Treatise on Musical Objects*, trans. John Dack and Christine North (Berkeley, forthcoming).

3 Denis Smalley, 'Spectromorphology and Structuring Processes', in *The Language of Electroacoustic Music*, ed. Simon Emmerson (London, 1986); Trevor Wishart. *On Sonic Art* (London, 1996); Roger Scruton, *The Aesthetics of Music* (Oxford, 1997); Luke Windsor, 'Through and around the Acousmatic: The Interpretation of Electroacoustic Sounds', in *Music, Electronic Media and Culture*, ed. Simon Emmerson (Farnham, 2000), 7–35; Brian Kane, *Sound Unseen: Acousmatic Sound in Theory and Practice* (Oxford, 2014).

4 Thom Holmes, *Electronic and Experimental Music: Pioneers in Technology and Composition*, 2nd ed. (London, 2008); Richard Taruskin, *Music in the Late Twentieth Century* (Oxford, 2009); Peter Manning, *Electronic and Computer Music*, 4th ed. (Oxford, 2013).

Schaeffer as establishing, through his practical work, a new ethics of listening itself, proper to electroacoustic media, in which the quantised matrices of melody, harmony, and rhythm fall away to allow the texturally and temporally continuous flows of a truly 'post-literate' sonic experience.

The consensus among disciples has been that, because Schaeffer's practice anticipated certain developments in the technical practice of electronic music and sound art, the ethics of listening he develops in the treatise is ripe for rediscovery.[5] Parallels have been drawn between Schaeffer's early account of radio and cinema as *arts-relais*, which figures human mastery as the key to the transformation of media into true instruments, and Walter Benjamin's call to reclaim the political power of mechanical reproduction.[6] But at the same time, a line of critique has emerged charging Schaeffer with an ahistorical, essentialist conception of the technologically-mediated listening he sought to theorise.[7] As Brian Kane has written, Schaeffer's theoretical writing 'silences' technology in favour of 'archetypal' human experience.[8] Combine this with the long-standing stereotype of *musique concrète* as a kind of naturalist foil to the serialist tradition,[9] and the deep strain of spiritual commitments which guided Schaeffer's interest in the actualisation of inner human potentials,[10] and what emerges is a picture of his treatise as a defence of human agency in the face of avant-garde technocracy. He states in the closing passage that what he felt made music unique was its power to speak directly to the human spirit. 'Sound objects, musical structures, when they are authentic, no longer have the mission of informing. They detach themselves from the

5 Évelyne Gayou, *GRM: Le Groupe de Recherches Musicales, cinquante ans d'histoire* (Paris, 2007); John Dack, 'Translator's Note' in Pierre Schaeffer, *In Search of a Concrete Music.*

6 Pierre Schaeffer, *Essai sur la radio et le cinéma : esthétique et technique des arts-relais 1941-1942*, ed. Carlos Palombini and Sophie Brunet (Paris, 2010); Carlos Palombini, 'Technology and Pierre Schaeffer: Pierre Schaeffer's Arts-Relais, Walter Benjamin's technische Reproduzierbarkeit and Martin Heidegger's Ge-stell', *Organised Sound* 3 (1998): 35–43; Igor Reyner, 'Les sources de l'écoute acousmatique dans les écrits de Pierre Schaeffer', *Synergies Royaume-Uni et Irlande*, 7 (2014): 85–91.

7 Brian Kane, 'L'Objet Sonore Maintenant: Pierre Schaeffer, Sound Objects and the Phenomenological Reduction', *Organised Sound*, 12 (2007), 15–24; Seth Kim-Cohen, *In the Blink of an Ear: Toward a Non-Cochlear Sonic Art* (London, 2009); Kane, *Sound Unseen*; Mitchell Hermann, 'Unsound Phenomenologies: Harrison, Schaeffer and the Sound Object', *Organised Sound*, 20 (2015): 300–307.

8 Kane, *Sound Unseen*, 39-40.

9 Paul Griffiths, *A Guide to Electronic Music* (New York, 1979); Georgina Born, *Rationalizing Culture: IRCAM, Boulez, and the Institutionalization of the Musical Avant-Garde* (Berkeley, 1995), 76-7; Michael Nyman, *Experimental Music: Cage and Beyond*, 2nd ed. (Cambridge, 1999), 48.

10 Philip Nord, 'Pierre Schaeffer and Jeune France: Cultural Politics in the Vichy Years', *French Historical Studies* 30 (2007), 685–709; Martin Kaltenecker, 'Résonances théologiques de l'écoute chez Pierre Schaeffer', *Droits de cités* 4 (2010), http://droitdecites.org/2010/10/15/kaltenecker/.

descriptive world, with a kind of bashfulness, to do nothing but speak better to the senses, the mind [*esprit*], and the heart.'[11]

Schaeffer's focus is clearly fixed on the human experience of musical sound. But at the same time he is reluctant to put his treatise forward as the basis for a practical system of composition. In focusing on the perceptual contours of the 'sound object' itself, he explicitly casts composition as a matter for ongoing experimental investigation. He chides the composer who rushes towards musical results without asking fundamental questions about their material and perceptual preconditions.[12] He presents the treatise not as a guide to composition, but rather as a prolegomenon to the discovery of 'possible musics' in the future.[13] It follows that, whereas Schaeffer's work should certainly be understood as 'reductive' in a methodological sense, it is not oriented towards reduction in an aesthetic sense. In fact, his phenomenological account of musical sound offers not only a basis for the invention of new musics, but a means of 'authentic analysis' applicable in principle to *all* musics. While the treatise describes the Western tradition as subsuming other musics under its own literate categories and thus refusing to hear them as anything but primitive attempts to achieve its own ends, Schaeffer's *solfège*[14] sets out to clear a new ground for encountering all musics on their own terms. 'The question is not to transcribe these languages into our alphabet,' he writes, 'but to discover the functions of their own musical objects and the original organisation that they determine.'[15] In this regard, the intended effect of Schaeffer's reduction might almost be thought of as approaching the 'irreduction' later put forward by Bruno Latour.[16] He seeks to undermine normative accounts of musical evolution, and open listeners to a more holistic plurality of sonic ontologies.

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11 Pierre Schaeffer, *Traité des objets musicaux : essai interdisciplines* (Paris, 1966), 662. Translations from French are my own unless otherwise noted.

12 Ibid, 360.

13 Ibid, 600-1.

14 A variety of translations are suggested in the literature, from Dack and North's 'music theory' to Luis-Manuel Garcia's 'grammar', but none captures the combination of practical and theoretical discipline entailed in the original, which I therefore retain throughout.

15 Ibid, 604.

16 Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, 1988).

This interest in defending the human nature of musical meaning in the face of technological change, and by extension protecting of the essential diversity of human expression, forms an ethical thread which is woven throughout the treatise. But Schaeffer's humanism also penetrates more deeply into the substance of his theory. In order to illustrate this I want to reconstruct a conversation between the treatise and a body of literature with which Schaeffer is not commonly associated: the structuralist reception of phenomenology in France, and the emergence of the modern 'human sciences' as famously deconstructed in Michel Foucault's *Les mots et les choses*, also published in 1966, and in Jacques Derrida's *De la grammatologie*, which appeared the following year.[17] Schaeffer's failure to address this network of associations may go part of the way, I claim, to explaining the neglect of Schaeffer's treatise as a work of philosophy in France, where the book's immediate conceptual context would have been greatly amplified. It could also help to explain the dismissal of Schaeffer's work by early structuralist music theorists in France such as Jean-Jacques Nattiez and Jean Molino. But most importantly, an excavation of Schaeffer engagement with structuralism highlights the limitations of his humanism, and this leads to a number of caveats which must be raised before contemporary readers should embrace it in English translation. Connecting his work with his contemporaries' views on the ethics of human culture and communication allows us to measure how debates have either absorbed or moved on from Schaeffer's concerns.

My focus is thus on the ethics embedded in Schaeffer's account of the listening subject as it appears in the treatise. As Jairo Moreno has argued, any account of musical objects presupposes a subject who is the 'locus of cognition' upon which ideas of listening and understanding can be constructed.[18] This is particularly true of Schaeffer's work. By reanimating its ethical engagements, I hope to show that Schaeffer's treatise provides us not so much with a heretical premonition of our

17 François Dosse, *History of Structuralism*, trans. Deborah Glassmann, (Volume 1, Minneapolis, 1997); Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences,* trans. Anonymous (London, 1970); Jacques Derrida, *Of Grammatology*, trans. Gayatri Chakravorty Spivak (Baltimore, 1974).

18 Jairo Moreno, *Musical Representations, Subjects and Objects: The Construction of Musical Thought in Zarlino, Descartes, Rameau, and Weber* (Bloomington, 2004), 7.

musical future, as with an articulation of a historically-specific 'listener function',[19] a bundle of auditory relationships and knowledge about audition that circumscribes aural subjecthood as such, proper to French intellectual life in the 1960s. If we are to make use of Schaeffer's 'interdiscipline' in the present, I contend, we must be aware of the political and epistemological baggage this listener function carries.

My intention is neither to trace the genesis of Schaeffer's intentions, nor to place the treatise on a logical continuum with his earlier writings and experiments. Instead I gather textual and intertextual evidence for the treatise's synchronic interaction with its immediate political and epistemological surroundings. My approach is thus archaeological in a Foucauldian sense.[20] I am concerned with the emergence of inter-related concepts across an archive, and not with their putative origins or genesis, which necessarily recede from view.[21] I begin by analysing Schaeffer's practical use of the treatise in conversation with colleagues and students. I then dive into the text itself, focusing on three issues which link Schaeffer to the contemporary French human sciences: the 'authenticity' of the musical object, the concept of entropy as a model of nature and culture, and the 'listening functions' at the centre of the musical subject. In effect I am arguing that Schaeffer's treatise offers much more than a guide to the production of *musique concrète*, which as early as 1958 Schaeffer seems to have considered to be a failed and partial experiment.[22] It sets aside the project of defining a new musical language per se in favour of outlining a functional perspective in which all forms of human sonic experience might be compared in their cultural and historical contingency. But in doing so it puts forward an image of audition in its putatively natural state which paradoxically blocks Schaeffer's appeal to musical and technological difference.

19 Veit Erlmann, *Reason and Resonance: A History of Modern Aurality* (New York, 2010), 23-4.
20 Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (New York, 1972).
21 Hubert Dreyfus and Paul Rabinow, *Michel Foucault: Beyond Structuralism and Hermeneutics* (Chicago, 1982), 37-41; Siegfried Zielinski, *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means*, trans. Gloria Custance (Cambridge, 2006).
22 Schaeffer, *Traité*, 24-6 and 360-85. See also Carlos Palombini, 'Machine Songs V: From Research into Noises to Experimental Music', *Computer Music Journal*, 17 (1993), 14–19.

Theory in Practice

Schaeffer claimed to have begun the treatise in the early 1950s, apparently during his directorship of the Groupe de Recherches de Musique Concrète (GRMC) for the Radiodiffusion-Télévision Française (RTF). In a 1969 interview he recounts that he had rewritten the book in its entirely no less than four times in those fifteen years.[23] By the time of its first publication, however, it also bore tangible traces of his interaction with students and colleagues at the GRM, the research unit that succeeded the GRMC following Schaeffer's return in 1958 from a stint training technicians for the French overseas service.[24] As Martin Kaltenecker describes, Schaeffer's group formed a kind of listening community charged with testing and verifying its leader's pronouncements. Early participants were responsible for classifying sound fragments using a system of punch cards to allow for easy sorting, and audiences were sometimes enlisted as focus groups to measure preference and perception in the wild.[25] 'The effort of synthesis that [the treatise] represents certainly engages the responsibility of the author,' Schaeffer writes in the preface to the 1966 edition, 'but it rests also on the multiple ancillary works and the collaboration of a whole group.'[26]

By subtitling the work *essai interdisciplines*—which gives the sense of an essay *between* disciplines more than something 'interdisciplinary', as the expression is now used—Schaeffer signals that he understands the book as falling outside the normal domains of the disciplines it touches upon, including acoustics, physiology, experimental psychology, electronics, and cybernetics.[27] The scope of the investigation is accordingly broad. After an introductory chapter placing the research historically as a response to a growing crisis of musical communication, the treatise proceeds in seven books. I focus here on the philosophical books—the first, second, and fourth—but many of the arguments I'm summarizing extend across the more methodological and

23 Marc Pierret, *Entretiens avec Pierre Schaeffer* (Paris, 1969), 97.
24 Étienne L. Damome, 'Vers un réseau outre-mer', in *Pierre Schaeffer : les constructions impatientes*, ed. Martin Kaltenecker and Karine Le Bail (Paris, 2012).
25 Martin Kaltenecker, 'L'Écoute comme exercise collectif', in *Pierre Schaeffer : les constructions impatientes*, ed. Martin Kaltenecker and Karine Le Bail (Paris, 2012), 191-201 at 198–9.
26 Schaeffer, *Traité*, 12 and 476-8.
27 Ibid, 30-1.

taxonomical portions of the treatise.

In the first, entitled *Faire de la musique* [Making Music], Schaeffer highlights the contingent relationship between music and instruments, tracing an evolutionary narrative from the simple 'neanderthal' calabash drum to the 'acousmatic' situation opened up by recording technologies. Borrowing freely from information theory, Schaeffer describes the emergence of musical meaning in terms of a balance between repetition and variation.[28] The instrument's fixed properties are part of the sedimented, redundant background against which novel information necessarily emerges. But the situation changes with electronic technologies, in which the sound is not necessarily defined by the physical properties of the source. The sound engineer must now cast musical judgements on the sounds the machines make possible.[29] The determination of a sound's musical potential shifts from the culturally and historically contingent instrument to the ear itself.[30]

In the second book, entitled simply *Entendre* [Hearing], Schaeffer zeros in on the system of 'functional' oppositions at the heart of his model of musical perception. His functions are numbered from one through four, each specifying a relationship between an intention and a type of object: *écouter* or indexical listening, *ouïr* or passive reception, *entendre* or qualitative hearing, and *comprendre* or understanding. He then proceeds to enumerate the possible circuits and oppositions that can occur between these relational states, before comparing his model with 'physiological' and 'physical' accounts such as those of Werner Meyer-Eppler and Fritz Winckel.[31] He concludes that the crux of musical communication is neither sensory nor acoustic, inviting the reader to imagine 'an experimental field of specifically musical perception, where the incitation of an exterior signal and the consciousness of a musical meaning would be conveniently confronted'.[32] He closes the book with a diagrammatic synthesis showing how the various 'dualisms' identified in the functional model can be subsumed in the 'original unity' of the sound object as disclosed by 'reduced

28 Ibid, 43.
29 Ibid, 85.
30 Ibid, 98.
31 Ibid, 134-6.
32 Ibid, 139.

listening'.[33]

After a third book devoted to juxtaposing standard psychoacoustic models of audition, which measures ordered correlations between stimulus and perception, and an 'experimental' model, which seeks to find origin of musical relations by focusing only on the structure of perception,[34] Schaeffer continues with a fourth book in which he posits the necessity of the sound object on a more general level. He opens by borrowing the notion of *epoché* from Husserl, claiming that by bracketing causal relations one constitutes the transcendental sound object in experience.[35] But he quickly leaves phenomenology behind to develop an account of the relations between objects and structures heavily influenced by the structuralist linguistics of Ferdinand de Saussure and Roman Jakobson, and specifically the notion of the phoneme.[36] Here he considers comparisons between traditional musical structure, linguistic structure, and the structure of 'natural sounds', focusing again on the relational interaction between the sound object and the various 'codes' which give it meaning.[37] He concludes the book with an argument for his own programme of research, which he suggests will enable the musician to derive new 'authentic' codes, practically and inductively, from the preparation and study of sound objects themselves, rather than with the help of pre-existing structures or scales.[38] Books five and six present the methodology and the results of this research: the criteria for a morphology and typology of sound objects, and a *solfège* leading to descriptive analysis and the 'synthesis of musical structures'. Again, however, Schaeffer is ambivalent about the potential for such a synthesis. He writes, 'We do not have at our disposal, for the moment, sufficient results to affirm anything at all on the level of possible or desirable syntheses.'[39] Finally, in book seven, he concludes with a restatement of his commitment to discipline as the essential path toward understanding and invention.

The early consensus inside the GRM seems to have been that, because Schaeffer's book was

33 Ibid, 154.
34 Ibid, 168-9.
35 Ibid, 267.
36 Ibid, 278 and 286-9.
37 Ibid, 282-3.
38 Ibid, 381.
39 Ibid, 498.

so idiosyncratically argued and far-reaching in scope, most readers would miss its core messages without special initiation. Writing in a celebratory issue of the GRM's in-house journal *Cahiers recherche/musique* for the tenth anniversary of the treatise's publication, Schaeffer's disciple Michel Chion offered this diagnosis of the conditions that seemed to have conspired so quickly against what, in his opinion, should have been a far more 'explosive' book:

> Contemporary music in 1966 was already softly awakening from the great scientistic and unifying dream of the post-war period—do you remember? A thousand years of serial music, an entirely determinate art-science… Music set about to accept its own madness, its relativity, the contingency and the diversity of its thousand 'discourses' [*langages*]. Thus, in an ideological situation that had become hospitable and flexible [*souple*], the *Traité* hardly found the resistance to confirm its impact. Furthermore, as it ignored psychoanalysis, marxism, and other current disciplines, it could not count on fashion to carry it. It didn't address itself except to those whom its ideas really interested; that is to say, very few people.[40]

In short, Chion claims, Schaeffer's early readers found themselves disarmed by a book filled with ideas that may have been all too timely, but which also refused to deal in the 'preemptory and scintillating phrases' that endowed the works of, say, a Roland Barthes or a Jacques Lacan with such energy for the French intelligentsia. Despite the rapid proliferation of institutions for 'music research' closely related to that which Schaeffer had promoted throughout his own institutional career, the *Traité* had already garnered a reputation as a *pétard mouillé*, weighed down with empty polemic, and appealing only to the 'closed sect' that had begun forming inside the GRM.[41]

Chion's eulogy stops enticingly short of naming the specific perpetrators of this injustice, but by 1976 the general tendency of post-1968 cultural reform had already moved away from his mentor's vision. In a 1974 push to depoliticize the French communications sector, the new government of Valéry d'Estaing had dismantled the monopoly of the Office de la Radio-Television

40 Michel Chion, 'Jubile pour un livre seul', *Cahiers recherche/musique*, 2 (1976), 19–24 at 20.
41 Ibid, 19-20.

Française (ORTF), a move which threatened to leave the GRM stranded. One year away from retirement, Schaeffer's last major task as director would thus be to fight for the life of the very institution he had fought so vehemently since the end of the war to preserve.[42] Schaeffer's efforts did meet some degree of success—the Institut national de l'audiovisuel (INA) took over all of the ORTF's archival and public outreach services early the following year—but his reputation as a researcher seems to have been more difficult to salvage.

The most important setback came about as a result of the high-profile alliance between d'Estaing's predecessor Georges Pompidou and Schaeffer's longtime rival Pierre Boulez. Georgina Born, building on earlier assessments by Pierre-Michel Menger, has characterized Pompidou's move as a calculated attempt to place the international *enfant terrible* of the avant-garde back in the service of national interests after the postwar decline of France's cultural profile and the political embarrassments of May 68.[43] Anne Veitl suggests that the move reflected the fact that French attitudes towards high culture still excluded radio and television.[44] Whatever the case, Boulez's ascendancy would be confirmed in 1977 with the opening of the Institut de Recherche et de Coordination Acoustique/Musique (IRCAM). In addition to luring away some of the GRM's precious technical staff, Schaeffer's followers saw IRCAM as hijacking the GRM's research mandate in the service of a malicious technocratic positivism.[45] Indeed, some early commentators seem to have seen the 'music research' of the GRM's ORTF phase as a mere stepping stone towards the Boulezian model that eventually eclipsed it.[46] Little wonder that Schaeffer's supporters felt so quickly obliged to distinguish their work from that of outsiders. 'If we now see well the seductions of a "scientistic" conception of musical research (a feeling of knowledge and of power over sound),'

42 Pierre Schaeffer, *Les Antennes de Jéricho* (Paris, 1978); Évelyne Gayou, 'The GRM: Landmarks on a Historic Route', *Organised Sound*, 12 (2007), 203–11 at 208-9. For a broader account of the rise and fall of Schaeffer's model of musical research highlighting its ramifications for the governance of contemporary music in France see also Anne Veitl, *Politiques de la musique contemporaine : le compositeur, la « recherche musicale » et l'état en France de 1958 à 1991* (Paris, 1997).

43 Georgina Born, *Rationalizing Culture: IRCAM, Boulez, and the Institutionalization of the Musical Avant-Garde* (Berkeley, 1995), 80-6; cf. Pierre-Michel Menger, *Le paradoxe du musicien* (Paris, 1983).

44 Veitl, *Politiques*, 43-4.

45 Martin Kaltenecker and Karine Le Bail, 'Jalons', in Martin Kaltenecker and Karine Le Bail (eds.), *Pierre Schaeffer : les constructions impatientes* (Paris, 2012), 9–65 at 56.

46 See Born, *Rationalizing Culture*, 85–6 and Veitl, *Politiques.* This interpretation, framed by Born as a progression and by Veitl as a decline, would have seemed highly plausible at the peak of IRCAM's notoriety in the 1990s.

Chion's eulogy for the *Traité* continues, 'we also see well that SCHAEFFER brought division and doubt to this domain by dealing in truths such as these: sound perceived *is not* the physical signal, music *is not* acoustics, it *is not* absolute structure, but the result of a relation between subject and object.'[47]

And yet the late-twentieth-century Schaefferian literature made little progress in popularizing these distinctions. From the series of *guides* and *lexiques* which appeared in France,[48] to the various exegeses and expansions proposed in the United Kingdom,[49] most readers favoured a view of the treatise as a collection of practical advice specific to the electroacoustic medium. The GRM itself seems to have accepted its place in the shadow of IRCAM, turning its attention from the rigours of Schaeffer's experimental music research to a more traditional public life of concert series, pedagogical outreach, and services to composers.[50] Meanwhile, in the final years of his life, Schaeffer expressed a palpable dismay, at times bordering on detraction, at the progress of contemporary composition.[51] Instead of taking up the hard task of arguing for a generalised, 'authentic' *solfège* applicable to all musics, Schaeffer's disciples had chosen the much less controversial course of ensuring the survival of their own genre.

Part of the reason that reception of the treatise remains so troubled and fragmentary may be that Schaeffer's conceptual toolbox is still so often abstracted from this larger didactic ambition. Of course, the centrality of education in Schaeffer's career as a whole has not gone unnoticed. 'Trying to bend oneself to a discipline that opposes one's penchants', he declares in a 1969 interview, 'even

47 Chion, 'Jubile pour un livre seul', 21 [original emphasis].

48 Michel Chion, *Guide des objets sonores : Pierre Schaeffer et la recherche musicale* (Paris, 1983); Michel Chion, *L'art des sons fixés : ou la musique concrètement* (Paris, 1991); François Bayle, *Musique acousmatique : propositions... positions* (Paris, 1993), 179-90; Jean-François Augoyard and Henri Torgue, *Sonic Experience: A Guide to Everyday Sounds*, trans. Andra McCartney and David Paquette, (Montreal, 2005). There is also an unpublished practical *lexique* by Québécois composer Marcelle Deschênes, designed for use in the electroacoustic curriculum at Université de Montréal beginning in 1980.

49 Denis Smalley, 'Spectromorphology and Structuring Processes', in *The Language of Electroacoustic Music*, ed. Simon Emmerson (London, 1986), 107–26; John Dack, 'The Relationship between Electro-Acoustic Music and Instrumental/Vocal Composition in Europe in the Period 1948-70' (PhD Thesis, Middlesex, 1989); Carlos Palombini, 'Pierre Schaeffer's Typo-Morphology of Sonic Objects' (DPhil thesis, Durham, 1992).

50 Gayou, 'The GRM', 209-10.

51 Tim Hodgkinson, 'An Interview with Pierre Schaeffer - Pioneer of Musique Concrète', *ReR Quarterly*, 2, 1 (1987), 4–9.

if one only reaches it imperfectly, is one of the only means of liberation that I know.'[52] Beginning with the visits of students like Pierre Henry, Pierre Boulez and Karlheinz Stockhausen to the fledgling *Club d'essai*, Schaeffer's research into sound had always been integrated with pedagogy.[53] Indeed, this commitment seems to have grown from the seeds of his work as a Catholic scoutmaster during the occupation.[54] The GRM launched an informal two-year *stage* as a prerequisite to membership in 1961. In 1968, this was replaced with a one-year course accredited by the Conservatoire de Paris. Schaeffer took up a faculty post as its director, a move the GRM must have seen as signalling a consecration of their founder's ideas.[55] From that point until the opening of the INA in 1976, the more intensive Conservatoire course served as the GRM's main intake point for new *stagaires*. The fragments of its content that survive paint a remarkably holistic picture of Schaeffer's outlook.

A syllabus circulated to students in advance describes the course in sweeping terms as an 'experimental' introduction to the 'new musical concepts' and 'new practices' brought about by the 'influence of audio-visual techniques on music' and the 'evolution of musical careers as a function of record, radio, cinema and television'.[56] The document addresses an audience not only of composers, but of advanced students in all disciplines.[57] The mandatory module taught by Guy Reibel and Henri Chiarucci on *solfège expérimentale*, for example, should be 'just as useful to the instrumentalist as to the composer, to the orchestral conductor as to the listener, and to all musicians

52 Pierret, *Entretiens avec Pierre Schaeffer*, 74.
53 Robin Maconie, *Other Planets: The Music of Karlheinz Stockhausen* (Lanham, 2005), 99; Schaeffer, *In Search of a Concrete Music*.
54 Philip Nord, 'Pierre Schaeffer and Jeune France'.
55 Gayou, 'The GRM', 207.
56 Groupe de Recherche Musicale, 'Musique fondamentale et appliquée à l'audio visuel' (Paris, 1968), Montreal, Private Archive of Marcelle Deschênes.
57 The class of the GRM's first Conservatoire course didn't necessarily live up to the aspiration. It consisted mainly of composers, alongside a handful of pianists, vocalists, and engineers. Among the more notable of the 40 enrolled in the 1968-69 session were: later GRM member Jacques Lejeune; the founders of the Groupe de Musique Expérimentale de Bourges, Christian Clozier and Françoise Barrière; Canadian composers Micheline Coulombe Saint-Marcoux and Marcelle Deschênes, founders of the electroacoustic courses at the Conservatoire de Montréal and Université de Montréal, respectively; Argentine composers Luis-Maria Serra and Eduardo Bertola; and a considerable number of psychedelic rock enthusiasts, among them Igor Wakhévitch, who would go on to compose music for Salvador Dalí's neglected 1974 opera *Être Dieu*. Groupe de Recherche Musicale, 'Stage 68/69' (Paris, 1968), Montreal, Private Archive of Marcelle Deschênes.

exercising pedagogical or critical responsibilities'.[58] The remaining modules fell into three streams acccording to specialty. The first, taught by Bernard Parmegiani and Albert Laracine, offered training in 'execution in front of the microphone' for the 'young virtuosos' who needed to learn to perform in studio for the technicians of the ORTF. The second, taught by Schaeffer himself with assistant Daniel Charles, was the provocatively titled *musique fondamentale*. In a series of 'open discussions', it promised to cover the state of contemporary music, the development of new materials and forms, the music of non-western cultures, and the role of music in society. Again, the syllabus strikes a now familiar note of movement across disciplines. It specifically invites participation from researchers outside the conservatory, calling emphatically to 'renew musical culture through a confrontation with other disciplines and through a re-examination of its social functions, and indeed of its organization and its economy'.[59] Only the third stream—led by François Bayle and Ivo Malec, and entitled *stage de musique expérimentale*—places explicit emphasis on compositional matters. And in keeping with the energy of the times, these classes situate *musique concrète* within broader aesthetic and political concerns. Specifically, Bayle and Malec highlight the importance of improvised and collective creation, encouraging students to explore theatrical and participatory actions clearly associated with the new politics of artistic liberation. Examples for analysis included the work of utopian collectives like Musica Elettronica Viva, whose performances students also had opportunities to attend in person.[60]

We can track Schaeffer's presentation of his own ideas in the classroom with the help of notes taken in simplified shorthand by his Québécois student, Marcelle Deschênes, who had won a scholarship to attend after completing her examinations in composition under Serge Garant at Université de Montréal.[61] Deschênes' notebook records seven lectures by Schaeffer ranging from the

58 Groupe de Recherche Musicale, 'Musique fondamentale'.
59 Ibid.
60 Ibid. On the politics of MEV's practice during this period see Amy Beal, '"Music Is a Universal Human Right": Musica Elettronica Viva', in *Sound Commitments: Avant-Garde Music and the Sixties*, ed. Robert Adlington (Oxford, 2009).
61 Marcelle Deschênes, 'GRM Notebook 68-69', Montreal, Private Archive of Marcelle Deschênes; Marie-Thérèse Lefebvre, 'Micheline Coulombe Saint-Marcoux et Marcelle Deschênes : Pionnières dans le sentier de la création électroacoustique', *Circuit : musiques contemporaines*, 19 (2009), 23–41.

introductory session of 20 November 1968, to an undated session in early February 1969, as well as six *solfège* sessions, and six sessions of *musique expérimentale*. Rather than follow the book's argument to the letter, Schaeffer's seminar samples unevenly from the Introduction and the philosophical books I summarized above. He devotes a full four sessions to the introductory arguments on music's 'historical situation'. He appears to have moved quite studiously through his theory's rationale, interpolating musical and visual illustrations that range from Varèse to gagaku. Again, his emphasis is on understanding musical listening as such, considered separately from any defence of *musique concrète*. To paraphrase the first lecture, Schaeffer saw contemporary music as undergoing a crisis of its codes and systems of reference. This crisis had been brought about by three factors. First, composers had begun to explore new materials, and thus listeners were confronted with a previously unknown diversity of experimental idioms. Second, technology had transformed both the production of music and the shape of the musical *métier*. And third, mass communication and globalization had opened listeners around the world to the musics of others; the 'intellectual colonialism' of previous generations was being supplanted by a rising curiosity towards the plurality of musical expression around the world.[62] What was required, Schaeffer went on to say, was a reconsideration of the fundamentals of all musics guided by a 'very general humanism'. The new discipline should aspire to the structural universality of Saussure's linguistics and Lévi-Strauss' anthropology, but also harness the empirical and analytical power of recording and broadcast technology.[63] This meant understanding the shared structures that allow listeners to make sense of music as individuals. One must, he argues, 'substitute the idea of robust systems relying on notation with a lived music, sensed in diverse ways'. Turning to the listening experience allows us to rethink music in a 'modern' way, recognising it as having a 'relativity' akin to Einsteinian physics.[64] He spends the next three sessions expanding on the historical conditions for this renewal.

How do we square this emphasis on plurality and relativity with Schaeffer's reputation as a

62 Ibid, cf. Schaeffer, *Traité*, 17–9.
63 Deschênes, 'GRM Notebook 68/69'; cf. Schaeffer, *Traité*, 38.
64 Deschênes, 'GRM Notebook 68-69'.

strict disciplinarian and a purveyor of essentialist 'myths' about the relationship between listening and technology?[65] Does reduced listening help or hinder musical pluralism?[66] Several aspects of the treatise already point to a structuralist synthesis. First of course is the methodical course of empirically-informed classification Schaeffer insists upon as a prerequisite to musical invention, an approach Luis-Manuel Garcia describes as 'grounded in epistemologies of laboratory science' and 'lavishly taxonomic'.[67] Indeed, early students found themselves totally disarmed in their efforts to derive compositional prescriptions from the vast matrix of phenomenal categories Schaeffer's practice produced.[68] Perhaps this explains why prominent figures like Boulez dismissed the treatise as the work of a mere technician.[69] We can give Schaeffer more credit, I suggest, by following the links to structuralism evident in the treatise's treatments of history, culture, and perception. Structuralism also provides an important context for Schaeffer's reception of phenomenology, which some commentators have criticised as incomplete or erroneous.[70] In fact, when the topic of the phenomenological reduction arises in the fifth and sixth lectures of the 1968 stage, Schaeffer sets it aside as only one of many paths in the disciplinary 'crossroads' necessitated by the project of fundamental music research. Tellingly, his focus is not on the short technical explanation of the *époché* in Book IV, but the division of 'listening functions' that opens Book II.[71] Reading it as a rubric for discerning between levels of sonic signification, I suggest that its broader purpose is in a certain sense to naturalize the play of musical difference.

65 Kane, *Sound Unseen*, 40–1.

66 Many in the anglophone acousmatic tradition, for example, figure reduced listening as a special analytical attitude that excludes the kind of contextual information that makes most music meaningful. Denis Smalley, 'The Listening Imagination: Listening in the Electroacoustic Era', *Contemporary Music Review*, 13 (1996), 77–107; Leigh Landy, 'Écoute Réduite - a Wrong Turn in the History of Electroacoustic Music?' *NZEMS 2009* (Auckland, 2009); Adrian Moore, *Sonic Art: An Introduction to Electroacoustic Music Composition* (New York, 2016).

67 Luis-Manuel Garcia, 'Beats, Flesh, and Grain: Sonic Tactility and Affect in Electronic Dance Music', *Sound Studies*, 1 (2015), 59–76 at 67–8. On the association between structuralism and scientific approaches in the avant-garde see also Morag Grant, *Serial Music, Serial Aesthetics: Compositional Theory in Post-War Europe* (Cambridge, 2001) and Taruskin, *Music in the Late Twentieth Century.*

68 François Delalande, 'Ce que le G.R.M. pense du T.O.M.', *Cahiers recherche/musique*, 2 (1976), 27–33.

69 Born, *Rationalizing Culture*, 76.

70 Kane, *Sound Unseen*; Makis Solomos, 'Schaeffer phénoménologue', in *Ouïr, entendre, écouter, comprendre après Schaeffer*, ed. François Bayle and Denis Dufour, (Paris, 1999), 53–67.

71 Deschênes, 'GRM Notebook 68-69'.

Object – Structure – Subject

Schaeffer prefaces his brief account of the phenomenological reduction in the treatise by reflecting on the value of the phenomenological enterprise. Instead of using philosophy to deduce an experimental method, Schaeffer claims to have arrived at a philosophical explication only through slow and painstaking practice: 'From fortuitous discovery to experiment [*expérience*], from experiment to explication, we have followed the normal trajectory of all experimental research.'[72] And yet, this process could have continued forever, making appeal 'to the theory of knowledge [*connaissance*], and to the relations of man with the world.'[73] Thus, his engagement with phenomenology must be pragmatic. 'Let us strive not to lose ourselves in a debate which has gone on for centuries, and recognise at least, when we find them formulated by philosophers, the principles that correspond to our implicit experience. Let us choose among the intellectual tools that others have spent their lives forging, those which are adapted to our needs.'[74] And yet, in the following paragraph, he makes his famous claim to have been 'doing phenomenology without knowing it, which is better, all things considered, than talking about phenomenology without practicing it.'[75] In a sense, Schaeffer is implying here that his experiments would have had the same results if he had never heard of phenomenology and continued to follow his 'implicit experience'. So what value would his claim to phenomenological 'correspondence' have had for his initial readers? What intellectual links would this rather cursory gesture to the phenomenological tradition establish for Schaeffer at this stage in his career?

Most commentators focus on the phenomenological sources cited directly in the treatise. Noting that the typo-morphology and the *solfège* which constitute the bulk of the treatise are more phenomenological in style than in substance, Makis Solomos points to the influence of Maurice Merleau-Ponty, who until his sudden death in 1961 was the main proponent of the tradition in France. The descriptive tables in Book VI, for example, treat sound objects as if they were

72 Schaeffer, *Traité*, 261–2.
73 Ibid, 262.
74 Ibid.
75 Ibid.

sensations independent of perception, and thus discard whatever remains of their pre-subjective universality.[76] Kane argues against Solomos that Schaeffer's phenomenology was primarily Husserlian, pointing to the increasing availability of Husserl's work in France through translations by Paul Ricoeur, Emmanuel Levinas, and Suzanne Bachelard, and highlighting Schaeffer's strict account of the *époché*.[77] Both connections are important for understanding how the reduction operates in the treatise, but they leave the connection between the reduction and the taxonomies unexplained. By looking closer at the public life of phenomenology around the time of the publication of the treatise, can we reconstruct the bridge between the 'lived experience' of reduction and the 'functional' mechanics of the *solfège*?

Schaeffer's reading of the reduction comes rather late in the French reception of phenomenology. By the time the treatise was finally published the phenomenological method had undergone several waves of reinterpretation as political and technical debates shifted from the existentialist reception that dominated the war years to the structuralist one that emerged in the 1950s.[78] For the existentialist thinkers, phenomenology was far removed from Husserl's detached, formalist search for universal essences. Following Heidegger, they stood for a phenomenology that privileged situated, lived experience.[79] Jean-Paul Sartre, for example, accused Husserl of being 'a phenomenalist rather than a phenomenologist', so trapped in his idealist world of functional descriptions of essences that he was unable to grasp the 'existential dialectic', the relationship of the thinking mind or *cogito* to the 'totality of being which constitutes human reality'.[80] They also came under the influence of Russian emigré Alexandre Kojève's lectures on Hegel,[81] discarding the

76 Solomos, ‘Schaeffer Phénoménologue’.
77 Kane, *Sound Unseen*, 17–22.
78 Dosse, *History of Structuralism*, 37-42; Edward Baring, *The Young Derrida and French Philosophy, 1945-1968* (Cambridge, 2011), 46-7.
79 Martin Halliwell and Andy Mousley, *Critical Humanisms: Humanist/Anti-Humanist Dialogues* (Edinburgh, 2003), 41-3.
80 Jean-Paul Sartre, *Being and Nothingness: A Phenomenological Essay on Ontology*, trans. Hazel E. Barnes, (New York, 1992), 119-20.
81 Alexandre Kojève, *Introduction to the Reading of Hegel: Lectures on the Phenomenology of Spirit*, trans. James H. Nichols, (Ithaca, 1969). These lectures, which took place at the École pratique des hautes études between 1933 and 1939, were attended not only by Sartre, Beauvoir, and Merleau-Ponty but also Georges Bataille, Jacques Lacan, and Raymond Aron. Kojève's 'neo-Marxist' and 'post-Heideggerian' reading of Hegel also had a formative influence on the post-structuralist generation. See Jacques Derrida, *Spectres of Marx*, trans. Peggy Kamuf, (New York, 2006), 91.

transcendental subject of the Husserlian reduction for a historical account of the subject in open-ended, dialectical progress. Kojève's Hegel appealed strongly to a generation forced to reconstruct its ethical outlook in the aftermath of war. 'Hegel's thought is existentialist', argued Merleau-Ponty in a 1946 article, 'in that it views man not as being from the start a consciousness in full possession of its own clear thoughts but as a life which is its own responsibility and which tries to understand itself.'[82] Thus the existentialists replaced the question of disclosing essences in their purity with a dialectical critique of values that foregrounded the interrelationship between the meaning in things and the meaning proffered by consciousness.[83] As Sartre argued, there could be no meaning except in the situated, intentional choice of a free, individual human subject, and thus the basis of moral behaviour was taking responsibility for one's own role in constructing the world.[84]

The existentialists remained influential long after the war, but their 'humanist' message quickly sprouted a variety of anti-humanist reactions. By the early 1950s, the existentialist emphasis on freedom and authenticity was under attack from young philosophers on the left reading Husserl for his work on the sciences rather than as a theorist of 'bourgeois subjectivity', and by Christians seeking to counteract Sartre's atheism.[85] Schaeffer's position is ambiguous, but his optimism about the universality of individual experience, suspicion about the reach of modern science, and unorthodox spiritual values, seem to have placed him more often on the side of the humanists, even by the time the treatise appeared.[86] By listening beyond the 'natural' and the 'cultural' Schaeffer seeks an 'authentic sound object... accessible if possible to every listening person.'[87] He was not the first to express such views. As music critic for *Les Temps modernes*, serialist composer René Leibowitz became a vocal proponent of an existentialist ethics.[88] Among the first to apply

82 Maurice Merleau-Ponty, 'Hegel's Existentialism', in *Sense and Non-Sense*, trans. Hubert Dreyfus and Patricia Allen Dreyfus, (Evanston, 1964), 63-70 at 65.
83 Dosse, *History of Structuralism*, 37.
84 Jean-Paul Sartre, *Existentialism and Humanism*, trans. Philip Mairet (London, 1948), 41.
85 Baring, *The Young Derrida*, 40-7; cf. Tran Duc Thao, *Phenomenology and Dialectical Materialism*, trans. Daniel Herman and Donald Morano, (Dordrecht, 1986); Jean-François Lyotard, *La Phénoménologie* (Paris, 1954).
86 Kaltenecker, 'Résonances théologiques de l'écoute chez Pierre Schaeffer'. Palombini suggests that the appeal of phenomenology for Schaeffer was that it provide him a suitably scientific weapon to fight against the scientificity of *elektronische Musik*. Palombini, 'Pierre Schaeffer's Typo-Morphology of Sonic Objects', 57-8.
87 Schaeffer, *Traité*, 271.
88 See also René Leibowitz, *L'Artiste et sa conscience : esquisse d'une dialectique de la conscience artistique* (Paris, 1950).

existentialist phenomenology as an analytical method was Russian émigré Boris de Schloezer in his 1947 *Introduction à J.-S. Bach*. Completed during the war, Schloezer's book on Bach takes a deceptively experimental approach to its very traditional subject matter. Instead of the digestible 'life and works' promised by its title, *Introduction à J.-S. Bach* sets out toward the much more ambitious goal of 'rethinking the musical fact' as such.[89] While Schloezer's conclusions converge on the 'concrete ideality' of the musical work in a manner reminiscent of Roman Ingarden,[90] his work clearly anticipates Schaeffer's in both its methodology and its terminology.

Charting a synthetic course between subjectivism and objectivism similar to Merleau-Ponty's in the introduction to *Phénoménologie de la perception*, Schloezer considers how the musical work can remain a 'concrete' thing at the same time as being independent of the three modes of materiality he identifies as pertaining to musical phenomena: the graphic materiality of the score, the vibrational materiality of acoustic waves, and the psychological materiality of the 'mental attitudes' to which the sounds give rise in the brains of listeners.[91] After considering the differences between musical and linguistic signification, he concludes, in terms which strongly resemble Schaeffer's in Chapter 17 of the *Traité*, that while in linguistic communication the sounding signifier is an arbitrary element effectively effaced by the mental signified, in music the sonic is heard and interpreted as such, not decoded into some other form but immanent to the musical experience.[92] Understanding music thus consists for Schloezer not in mastering a reference system of scales and chords, but in adopting a particular kind of listening attitude: not just hearing (*entendre*), but attending (*écouter*) to the series of sounds with a view towards comprehending (*comprendre*) it as a system of immanent relations.[93] Curiously close matches to Schaeffer's

89 Boris de Schloezer, *Introduction à J.-S. Bach : essai d'esthétique musicale* (Paris, 1947), 12.

90 Fragne, 'À la recherche de la réalité musicale', v; cf. Roman Ingarden, *The Work of Music and the Problem of Its Identity*, trans. Adam Czerniawski, (London, 1986). Schloezer also corresponds with Ingarden in his insistence that the musical work can be reconstructed, or in Ingarden's terms 'concretized' by the listener following an engaged reception (see Schloezer, *Introduction*, 45). Ingarden studied with Husserl in Göttingen and Freiburg and was one of the first to apply the phenomenological reduction to music. Ingarden's work on music was not translated into French until the 1980s, but Schloezer may have read it in German. Max Rieser, 'Roman Ingarden and His Time', in Roman Ingarden *The Work of Music and the Problem of Its Identity* (London, 1986), 159–73 at 161.

91 Schloezer, *Introduction*, 27; cf. Maurice Merleau-Ponty, *Phénoménologie de La Perception* (Paris, 1945).

92 Schloezer, *Introduction*, 33; cf. Schaeffer, *Traité*, 296-7. Note that Schloezer and Schaeffer are both engaging here with Ferdinand de Saussure's *Cours de linguistique générale*, the significance of which I return to below.

93 Schloezer, *Introduction*, 33-35. Schloezer uses the words for these attitudes differently from Schaeffer's listening

language and approach can also be found. Schloezer uses the term 'objet sonore', for example, to distinguish the musical work from its acoustic materiality,[94] the term 'allure' to distinguish the experienced sense of timing from the absolute values of tempo and note duration,[95] and the terms 'concrete' and 'abstract' to distinguish the real and specific aspects of musical phenomena from their discursive descriptions and categorizations.

A similar concern with authenticity informs Swiss conductor Ernest Ansermet's formidable 1961 volume *Les Fondements de la musique dans la conscience humaine*.[96] Conceived in 1943, sketched between 1948 and 1951, and first published in 1961, Ansermet's book is encyclopedic in scope, if not necessarily in substance.[97] Its 700 pages include discussions of musical consciousness, the auditory horizon, the embodiment of music in sound, the form of musical expression, and the evolution of music through history, alongside nearly 200 pages of 'marginal notes' on science, history, and the 'structures of reflection'. In spite of its author's obvious enthusiasm, the book is riddled with idiosyncrasies. Like Schloezer and Schaeffer, Ansermet understood music to have form and meaning only in the immediate flow of the listening experience. While acousticians might look for the reactions of the ear to physical waves, for Ansermet the crux of the musical experience lay in the way these waves, via the auditory apparatus, could be resolved into chords and intervals by an active musical consciousness.[98] Ansermet thus sought to ground an authentic listenership attuned to organic, prescientific reflection, the authority of which he saw as under assault by the forces of scientism and an ascendent serialist avant-garde.[99] Lured by Husserl's mathematical writings, however, Ansermet concludes the correlation between acoustic vibration and musical apperception must be governed by a transcendental system of 'noetic logarithms', the exposition of which occupies much of the opening chapter and several of the appendices.[100]

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functions, which I discuss below. Hence the difference in my translation.

94 Schloezer, *Introduction*, 44.

95 Schloezer, *Introduction*, 57-58.

96 Ernest Ansermet, *Les Fondements de la musique dans la conscience humaine et autres écrits* (Paris, 1989).

97 Jean-Claude Piguet, *La Pensée d'Ernest Ansermet* (Lausanne, 1983).

98 Ansermet, *Fondements*, 373-9.

99 Ansermet, *Fondements*, 296-7 and 896-907.

100 Ansermet, *Fondements*, 314-8. Solomos highlights this problem in a justifiably dismissive mention of Ansermet's book. See Solomos, 'Schaeffer phénoménologue'.

Although he makes no reference to them in the treatise, there is little doubt that Schaeffer was aware of his precursors while writing it. Chapter 14 of his earlier book *À la recherche d'une musique concrète* is devoted almost entirely to Schaeffer's reflections on sketches which Ansermet had presented at early meetings of the International Music Council in Paris. Here Schaeffer responds at length to Ansermet's existentialist attempt to resolve the correlation between musical objects and subjects, dubious of his mathematical speculations, but approving of the denouncement of serialist music as 'inauthentic'.[101] Although it contains no explicit citations to Schloezer's work, Schaeffer's 1952 book does contain frequent references to the work of Bach, and at one point speculates on the fruitfulness of an attempt to apply *Gestalt* theories to Bach that obviously recalls Schloezer's work.[102] Conversation around Schloezer's use of phenomenology aired prominently both in *Les Temps modernes* and elsewhere in years following the war,[103] and Schloezer was among the most notable reviewers of Schaeffer's *À la recherche*.[104]

By the time the treatise appeared in 1966, however, phenomenology's force of attraction in French intellectual culture had diminished in the face of sustained anti-humanist critique.[105] The German left attacked phenomenology's development under Heidegger. Adorno, for example, saw the 'authentic' space left over after the phenomenological reduction as an abdication of critical engagement.[106] A second line of attack came from the existentialists' students in France. Foucault was particularly skeptical of his teacher Merleau-Ponty's efforts to take the lived experience of the body as the condition of existence of all knowledge.[107] According to Foucault, the existential phenomenologist claimed to prove the transcendence of the body, but provided only empirical observations on its particular conditions.[108] Furthermore, the existential phenomenologist asserted

101 Schaeffer, *In Search of a Concrete Music*, 113-22.
102 Schaeffer, *In Search of a Concrete Music*, 153-6 and 163-6.
103 Robert Francès, 'La Structure en musique', *Les Temps modernes* 43 (1948), 730; Boris de Schloezer, 'Sens, forme et structure en musique', *Les Temps modernes* 43 (1949), 939. See also Pierre Boulez, 'Bach's Moment', in Paule Thévenin (ed.), *Stocktakings from an Apprenticeship*, trans. Stephen Walsh, (Oxford, 1991), 1–14 at 5-6.
104 Boris de Schlœzer, 'Musique concrète, musique abstraite, musique...', *La Nouvelle revue française*, 5 (1953), 920-3.
105 Jacques Derrida, 'Structure, Sign, and Play in the Discourse of the Social Sciences', in *Writing and Difference*, trans. Alan Bass, (London, 2001), 278-93; Dosse, *History of Structuralism*.
106 Theodor Adorno, *Philosophy of Modern Music*, trans. Anne G. Mitchell and Wesley V. Blomster, (London, 2007), 102-3.
107 Dreyfus and Rabinow, *Michel Foucault*, 33-4.
108 Ibid, 34.

that the horizon of practices and beliefs formed the necessary background of all thought, while at the same time asserting the methodological necessity of standing outside that background.[109] In short, for Foucault phenomenology took for granted the existence of the enculturated and historically sedimented 'man' it sought to establish as primary.[110] Schaeffer's treatise invokes phenomenological privilege long after the existentialist boom of the 1940s, and thus is significantly more susceptible to such criticisms than the work of Ansermet or Schloezer. The bracketing of background knowledge plays a central role in the way Schaeffer defines the intelligibility of the sound object.

In the treatise, Schaeffer folds the problem of the background into the category of 'structure'. He distinguishes three levels of structure at the close of Chapter 15, first for the relations between items in a set (such as the notes in a melody), second for the relations between figure and ground, third for the way the object is conditioned by a system of reference.[111] 'Remove this object from the structure to which it belongs', he writes in Chapter 16, 'and just as soon it becomes structure itself, and can hardly be appreciated except by mediating its resolution in objects at the level below.'[112] Elsewhere, the universality of the object-structure pair provides the conceptual basis for the practical distinction between typology and morphology. Where the typological procedure involves extracting sound objects from an undifferentiated continuum, the morphological procedure requires the objects to be reheard in terms of their *contextures*, that is, as structures of interrelated sub-objects themselves.[113] His approach towards structuralism as such is tentative, and like his phenomenology, couched in claims of pragmatic caution and musical particularism. The ambivalence that Claude Lévi-Strauss famously expresses toward *musique concrète* in the Overture to his 1984 book *The Raw and the Cooked* has been cited to suggest that Schaeffer should be considered as an object of structuralist criticism rather than a structuralist himself.[114] But Schaeffer's

109Ibid, 36.
110Foucault, *Order of Things*, 322.
111Schaeffer, *Traité*, 277-8.
112Ibid, 280.
113Chion, *Guide* , 56-7. Palombini, 'Pierre Schaeffer's Typo-Morphology of Sonic Objects', 65.
114John Dack, 'Acoulogie: An Answer to Lévi-Strauss?', in *Electroacoustic Music Studies Network Proceedings* (2007) http://www.ems-network.org/IMG/pdf_DackEMS07.pdf; Claude Lévi-Strauss, *The Raw and the Cooked.*

treatise does frequently respond to structuralist ideas, and his commitment to phenomenology would likely have had structuralist overtones for his immediate audience. Even Merleau-Ponty had negotiated a synthesis of existentialist and Saussurean principles by the end of his life.[115] 'For the philosopher', Merleau-Ponty writes in *Signs*, 'the presence of structure outside us in natural and social systems and within us as symbolic function points to a way beyond the subject-object correlation which has dominated philosophy from Descartes to Hegel. By showing us that man is eccentric to himself and that the social finds its center only in man, structure particularly enables us to understand how we are in a sort of circuit with the socio-historical world.'[116] Schaeffer seems to have been equally receptive to structuralist ideas about the function of culture and history.

We can track this reception in part through Schaeffer's engagement with information theory and cybernetics. American ideas about communication and control were crucial to the development of French structuralism, but they were also swiftly absorbed into popular discourse about the significance of modern technoscience.[117] Yet accounts of avant-garde interest in information theory have mainly focused on its use in formal construction, and particularly its centrality to the aesthetics of serialism.[118] Increasingly, however, information theory is recognised as having played a generative role in a wide variety of musical and scientific experiments during the Cold War, especially for the way it systematised the centrality of situated perception.[119] Diverging from the stereotype of a mechanistic science expressed in terms of hard-wired laws and offering only strictly-defined paths for attaining authority, cybernetics presented itself as a set of open-ended strategies

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Mythologiques, Volume One, trans. John Weightman and Doreen Weightman, (Chicago, 1983).

115 Dosse, *History of Structuralism*, 37-9.

116 Maurice Merleau-Ponty, *Signs*, trans. Richard McCleary (Evanston, 1964), 123.

117 The encounter between Lévi-Strauss and Jakobson in exile in New York is recounted in several sources, including Dosse's *History of Structuralism* and Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago, 1999). More recent studies have consolidated a more transatlantic account of the growth of information theory in France. See especially Céline Lafontaine, 'The Cybernetic Matrix of "French Theory"', *Theory Culture Society*, 24 (2007), 27–46; Christopher Johnson, '"French" Cybernetics', *French Studies*, 69 (2014), 60–78.

118 See for example Grant, *Serial Music, Serial Aesthetics*, 29-33; Jennifer Iverson, 'Statistical Form amongst the Darmstadt School', *Music Analysis*, 33 (2014), 341–87.

119 Christina Dunbar-Hester, 'Listening to Cybernetics: Music, Machines, and Nervous Systems, 1950-1980', *Science, Technology & Human Values,* 35 (2010), 113–39; Andrew Pickering, *The Cybernetic Brain: Sketches of Another Future* (Chicago, 2010).

supported by exchanges in legitimacy across disciplines.[120] Absolute formulas and normative abstractions were replaced with heuristic 'handbooks' aimed at democratising and hybridising knowledge production.[121] Schaeffer's project is shot through with anxieties over aesthetic and epistemological contingency, the challenges of induction and statistical prediction, and the breakdown of institutional authority, all of which are hallmarks of an information theoretical approach.[122]

Direct references to information theory first appear in Schaeffer's 1952 book *À la recherche d'une musique concrète*, where his understanding seems to have been mediated through the work of engineer and philosopher Abraham Moles. In addition to crediting Moles as a co-author on the book's final section, a sketch of the *Solfège de l'objet sonore* which would later be revised and expanded to form Book VI of the *Traité*, Schaeffer cites Moles' writing at length, focusing in particular on the emerging understanding of music in terms of information transmission.[123] At this point, Schaeffer's estimation of Moles is highly enthusiastic. Moles passed through Schaeffer's studio as an advisor while working on his first doctoral thesis in physics in Paris.[124] Following this stint with Schaeffer, he moved on first to Swiss conductor Hermann Scherchen's private electroacoustic studio in Gravesano,[125] and then, with the help of a modest grant from the Rockefeller Foundation, to the new Columbia-Princeton studio in New York City.[126] Moles draws heavily on his work with the GRMC in his 1958 philosophy thesis, *Théorie de l'information et perception esthétique*, and his 1960 Rockefeller Foundation report, *Les musiques expérimentales*.[127]

120See Geof Bowker, 'How to Be Universal: Some Cybernetic Strategies, 1943-70', *Social Studies of Science*, 23 (1993), 107–27 at 116.

121Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago, 2006).

122For a summary of cybernetic social and epistemological principles see Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (New York, 1954). For a recent assessment of the ontological repercussions of cybernetic knowledge practice see also Pickering, *The Cybernetic Brain*, 17-33.

123Schaeffer, *In Search of a Concrete Music*, 106-7.

124Abraham Moles, *Physique et technique du bruit* (Paris, 1952); Michel Mathien, 'Abraham Moles ou l'information et la communication. Au carrefour des sciences, de la vie quotidienne et de l'esthétique', *Communication*, 22 (2003), 167–81; Jean Devèze, 'Abraham Moles, un exceptionnel passeur transdisciplinaire', *Hermès*, 39 (2004), 189-200.

125Dennis Hutchison, 'Performance, Technology, and Politics: Hermann Scherchen's Aesthetics of Modern Music' (Ph.D. diss., Florida State University, 2003).

126Rockefeller Foundation, 'The Rockefeller Foundation Annual Report, 1956' (New York, 1956), 243; Otto Luening, 'An Unfinished History of Electronic Music', *Music Educators Journal*, 55 (1968), 136.

127Abraham Moles, *Théorie de l'information et perception esthétique* (Paris, 1958); Abraham Moles, *Les Musiques*

These books foreshadow Schaeffer's treatise in important ways. Here Moles draws liberally on the terms of existential phenomenology: referring to recording technology as providing a basis for 'eidetic variation', for example, and distinguishing the production of experimental music as an 'authentic composition' in comparison with traditional instrumental approaches.[128] Moles' main concern, however, was to develop a method for measuring the quantities of information contained in particular musical messages, and thereby to derive inductive judgments of their aesthetic value. It is here that we find the emergence of a structuralist account of the phenomenological background similar to the one Schaeffer adopts in the treatise.

For Moles, music was like any form of communication in that it imposed an essentially human order on the chaos of the natural universe.[129] The backbone of this aesthetics is the concept of entropy. Bracketing its origin in the technical language of thermodynamics, cyberneticians like Moles reduced entropy to a statistical formula for determining information content. If the receiver knew all the units in a series of values sent across a channel in advance, the amount of information transmitted would be zero. If the receiver knew none of the values in advance, however, the series would amount to absolute chaos. Calculating the entropy of the message allowed the receiver, knowing the probabilities of each unit in the code or language of communication, to calculate the incoming message's position on a scale between these extremes of order and disorder.[130] Several translations of the notion of entropy into musical terms were attempted around the same time. Leonard Meyer, for example, gives the role of stabilising nature to the diachronic progress of 'style', which provides a 'complex set of probabilities' internalized by composers and listeners alike to shape their 'habit responses' and 'latent expectations'.[131] Meaningful emotional responses to music arise for Meyer when these norms are broken—that is, when an individual becomes aware of a deviation, and his or her latent expectations become 'active'. For Meyer, it follows that information

expérimentales (Paris, 1960).

128Moles, *Les Musiques expérimentales*, 92.

129Moles, *Les Musiques expérimentales*, 91.

130Claude Shannon, 'A Mathematical Theory of Communication', *Bell System Technical Journal*, 27 (1948), 379–423.

131Leonard Meyer, 'Meaning in Music and Information Theory', *The Journal of Aesthetics and Art Criticism*, 15 (1957), 412–24 at 414.

quanta provide the source both of originality within the work, and of stylistic progress in history.[132] Moles' version, developed independently of Meyer's, is more complex and synchronic. Dividing the musical signal into a 'semantic message' consisting of quantifiable, convention-bound elements, and an 'aesthetic message' consisting of more or less ineffable states of perception, Moles identifies no less than eight simultaneous entropic fields which 'determine each other in an irregular alternation' during the listening experience itself.[133]

Moles appears in the treatise only as a scapegoat for the final remnants of the 'scientific attitude' that Schaeffer saw himself as having surpassed in the transition from *musique concrète* to *recherche musicale*. Moles' later writings continue to represent the sound object as a physical thing first and foremost, even including diagrams representing it as a solid three-dimensional mass.[134] The treatise takes several swipes at the engineer's 'imprudent' materialism.[135] But Schaeffer continued to model his understanding of the sound object's relationship with the historical and cultural domains of structure on the logic of entropy. This happens most prominently in the 'dialectical' pairing Schaeffer constructs between the two basic forces he calls *permanence* and *variation*.[136] In the prototypical form of the musical instrument, for example, Schaeffer finds a stable and repeatable set of material 'values' which must then be varied into a collection of 'characters' to form musical utterances.[137] He generalises the function of the sound object in similar terms, showing how 'the same object may be envisaged as carrier of several different structures' when reframed rhythmically, melodically, or harmonically.[138] He formulates the speculative thrust of the treatise by positing an object-structure relationship in which, rather than the object being articulated in relation to a pre-

132Cf. Leonard Meyer, *Emotion and Meaning in Music* (Chicago, 1956).
133See Moles, *Les musiques expérimentales*, 100-101.
134Moles, *Les Musiques expérimentales*, 42-47.
135See for example Schaeffer, *Traité*, 60, 167, 495.
136Schaeffer, *Traité*, 300-3, cf. Chion, *Guide*, 74-5.
137Schaeffer, *Traité*, 43-4. In a sense, Schaeffer's account of this logic's 'neanderthal' origins makes the distinction of 'sounds' from noise the source of musical civilisation itself. See also Hugues Dufourt, 'Pierre Schaeffer: le son comme phénomène de civilisation', in *Ouïr, entendre, écouter, comprendre après Schaeffer*, ed. François Bayle and Denis Dufour, (Paris, 1999), 69-82. Elsewhere, Bayle has described this as the crux of the treatise's argument. François Bayle, 'En deçà... au-delà... de l'entendre au faire', *E-dossier de l'audiovisuel : Pierre Schaeffer : quel héritage ?*, (Paris, 2010), http://www.ina-expert.com/e-dossier-de-l-audiovisuel-pierre-schaeffer-quel-heritage/en-deca-au-dela-de-l-entendre-au-faire.html.
138Ibid, 375-6.

existing structure, an 'authentic structure' might be generated by the qualities of particular set of objects.[139] In this sense, Schaeffer's understanding of musical entropy is not far removed from contemporaries like Boulez or the spectralists.[140] But the logic also exerts an influence on the treatise in the guise of a general ontological politics.[141] As Morag Grant has suggested in her work on serialist theory, entropy bears a strong resemblance to the Hegelian dialectic of nature and *Geist*, suggesting a scientific explanation for the historical progress of musical culture that could not have been far from the minds of post-war theorists.[142] Structuralists like Lévi-Strauss took a pessimistic view, deploying notions of dynamic equilibrium to relativize the mechanical civilisation that threatened to repress cultural diversity and alienate the authentic subject.[143] Thermodynamic metaphors offered a subtle means of resistance to the historical determinism of Marxist orthodoxy.[144] The new science of indeterminacy placed the observer of history and culture inside an open system, foregrounding the way techniques of knowledge and measurement construct their objects.[145] Schaeffer's proposal for *recherche musicale* is similarly anti-determinist, figuring the progress of musicological understanding as having arrived at an impasse in the face of mounting musical complexity.[146] He seeks to hold back the advance of musicological rationalisation to preserve the natural plurality that human musical communication has generated over the course of its history, and would continue to generate if allowed to develop 'authentically'.

Accordingly, Schaeffer's main concern is with the relational dynamics of individual perceptual structure. Roman Jakobson's turn from phonetics to phonology—from the science of vocal production to the play of phonemes as a synchronic system—is a frequent point of reference.[147] Schaeffer's listener is oriented towards the production of order in an increasingly

139Ibid, 381.

140See for example Jean-Jacques Nattiez, *The Battle of Chronos and Orpheus: Essays in Applied Musical Semiology*, trans. Jonathan Dunsby (Oxford, 2004); Eric Drott, 'Spectralism, Politics and the Post-Industrial Imagination', in *The Modernist Legacy: Essays on New Music*, ed. Björn Heile (Farnham, 2009), 39–60.

141Annemarie Mol, 'Ontological Politics. A Word and Some Questions', *The Sociological Review*, 47 (1999): 74–89.

142Grant, *Serial Music, Serial Aesthetics*, 80-7.

143Christopher Johnson, 'All Played Out? Lévi-Strauss's Philosophy of History', *New Left Review*, 79 (2013), 55–69; Dosse, *History of Structuralism*, 360-2.

144Ibid, 61; cf. Eric Drott, 'Rereading Jacques Attali's Bruits', *Critical Inquiry*, 41(2015), 721–56.

145Ilya Prigogine and Isabelle Stengers, *La Nouvelle alliance : métamorphose de la science*, 2nd ed. (Paris, 1986).

146Schaeffer, *Traité*, 16-20.

147Ibid, 36, 300; cf. Roman Jakobson, *Six Lectures on Sound and Meaning*, trans. John Mepham (Cambridge, 1978).

disordered musical universe. He establishes the relations he sees as underlying different kinds of auditory attention in the 'Table of Listening Functions' which appears on page 116 of the 1966 edition. The table presents four implicit levels of aural consciousness on a matrix distinguishing them in relation to a set of criteria for auditory sign construction: *écouter*, which Chion explains as 'lending the ear [to a sound source] through the intermediary of sound' or 'treating sound as an index of its source'; *ouïr*, or passively perceiving sound as such, with no attentional separation from the general acoustic background; *entendre*, which is to 'manifest a listening intention', or to select the qualities of a sound that are of interest in direct relation to other sounds; and *comprendre*, which is to grasp the meaning and values that correspond to the sound as an abstract sign, as in language.[148] Each function includes both a listening behaviour and a description of its semiotic correlates, the qualities of meaning or reference it engages. Perhaps because the terms Schaeffer chooses are so difficult to translate from French to English, anglophone scholars have written a great deal on their contrasting meanings. They are often discussed separately as a set of independent 'attitudes' or 'modes'.[149] Kane in *Sound Unseen*, for example, treats the listening functions as an unordered set of 'noetic acts', each of which corresponds to a different 'noemic' category of sound objects.[150] From this perspective, Schaeffer may appear to have simply reinvoked the familiar modernist distinction between active attention and passive d[i]straction, between listening and merely hearing.[151] Ian Biddle, for example, places Schaeffer's program under the sign of a 'fixated listening', ordered by modernity to 'hold listening in place' and 'keep the doors of the concert hall firmly closed.[152] But

On this point Schaeffer might have saved himself a great deal of trouble by reading Jakobson more closely. As Jakobson argued against Saussure, the basic units of language must be understood as coterminous with their operation as a relational set, not prior to it. 'The phoneme functions', Jakobson writes, '*ergo* it exists'. Reading between the lines of the *Traité* we find that the sound object functions in a similar way. Had Schaeffer's pragmatism outweighed his ambition to systematize, we may have been spared the debate that has swirled around a question of essences which is beyond the scope of an otherwise fairly straightforward exercise of structuralist analysis.

148Chion, *Guide*, 25; cf. Schaeffer, *Traité*, 112-7.

149Palombini, 'Pierre Schaeffer's Typo-Morphology of Sonic Objects', 31-46; Smalley, 'The Listening Imagination'; Eric F. Clarke, *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (Oxford, 2005), 143-4; Kane, *Sound Unseen*, 26-30.

150Kane, *Sound Unseen*, 26-7.

151Cf. Erlmann, *Reason and Resonance*, 21-2; Jonathan Sterne, 'Hearing', in *Keywords in Sound*, ed. David Novak and Matt Sakakeeny (Durham, 2015), 65–77 at 70-1.

152Ian Biddle, 'Listening, Consciousness, and the Charm of the Universal: What It Feels like for a Lacanian', in *Music and Consciousness: Philosophical, Psychological, and Cultural Perspectives*, ed. David Clarke and Eric F. Clarke (Oxford, 2011), 66–77 at 73.

such a reading fails to do justice to the order and juxtaposition of the functions.

Schaeffer's use of the table in the treatise foregrounds not the quality of the individual categories, but the relations made possible by the binary oppositions between the categories. Listeners are not meant to fall in a fixed mode by habit, but rather to follow what Chion refers to as perceptual 'circuits' between the sectors depending on the objects and intentions involved.[153] The functions are numbered from one to four, 'like the hands of a clock', and arranged into four quadrants which divide them according to two 'dualisms': 'abstract' in the left column versus 'concrete' in the right column; and 'objective' in the top row versus 'subjective' in the bottom row.[154] There are thus two functions in which meaning is derived from outward reference points—*comprendre* (referential or symbolic) and *écouter* (indexical)—and two which are directed by inner apperception—*entendre* (selective) and *ouïr* (receptive). Likewise there are two functions oriented by properties Schaeffer considers to be abstract—*comprendre* (sign values) and *entendre* (qualities of the sound itself which permit it to be divided and classified)—and two by those he considers to be concrete—*écouter* (agency, causality and materiality) and *ouïr* (the sonic as such). Several of the binary distinctions that appear in the course of Schaeffer's argument map onto the table in a similar way. For instance, the concrete listening common to all animals with ears (*écouter* and *ouïr*) is 'natural' for Schaeffer, while the deductive, abstract listening of convention-bound humans (*entendre* and *comprendre*) is 'cultural'.[155] The play of oppositions that the table of functions makes possible is an analytical device revealing the structural relations that underlie all auditory awareness.[156] An intersubjective consensus may be reached that an object fits with a particular category after repeated listenings, but this process is mediated by analysis.[157]

This heuristic and relational understanding of the listening functions arises frequently in Schaeffer's discussion of the differences between music and language. Both, he claims, are systems

153Chion, *Guide*, 25.
154Schaeffer, *Traité*, 116.
155Ibid, 120-2.
156For Dosse the principles of interrelation and generalization constitute the core of the structuralist method. Dosse, *History of Structuralism*, 22; cf. Howard Gardner, *The Mind's New Science: A History of the Cognitive Revolution* (New York, 1987), 198-202.
157Palombini, 'Pierre Schaeffer's Typo-Morphology of Sonic Objects', 42.

of signs issuing from a common material medium, and studying them thus calls upon a parallel set of disciplinary formations, focused on either signified or signified, in synchrony or diachrony.[158] Each system, however, suppresses a different quadrant in the table of listening functions. Linguistic listening discards *ouïr*, having no use for the reception of raw sonic detail, while musical listening discards *comprendre*, being unconcerned with symbolic reference.[159] The two kinds of communication are thus distinguished in terms of the relations they tolerate between the four listening functions, and not in terms of opposed modes of listening as such. This distinction undergirds a further point in Schaeffer's comparison between musical and linguistic signs. Saussure famously concludes that the material signifier (which for Schaeffer is equivalent to the object of *ouïr*) is merely an arbitrary component of the sign structure (which for Schaeffer is the object of *comprendre*). Schaeffer, however, asserts that the level of the sonic material is a necessary and fundamental component of musical communication, while the symbolic level of shared mental references is not.[160] This for Schaeffer places language closer to the influence of cultural norms for establishing shared codes, while music is closer to the raw forms of nature.

Schaeffer also uses the listening functions to structure the diagram entitled *Programme de la recherche musicale*, where he details the differences between traditional music studies and the experimental music research programme of the GRM.[161] Here again the quadrants are not divided between the two cultures, as if each privileged a different kind of listening in static opposition with the other. For Schaeffer, the same set of functions provides the basis for the way both formations use listening practice as a source of knowledge about sound. Where a conservatoire training calls upon the capacity for *écoute* in a course of *lutherie* or organology, the programme of experimental music research brings *écoute* with the synthesis of new musical objects. Where a conservatoire student needs to perform *ouïe* in perfecting his or her instrumental execution, an experimental

158Schaeffer, *Traité*, 294-5. In the previous chapter Schaeffer also entertains the notion that phonetics might be understood as a 'solfège des objets verbaux', Schaeffer, *Traité*, 289.
159Ibid, 307-9.
160Ibid, 296-7.
161Ibid, 369.

music researcher would do the same in a project of typology. Schaeffer draws similar analogies between the *entendres* of orchestration and morphology, and between the *comprendres* of traditional music theory and experimental *solfège*. The distinction between the two systems is thus not the functions they occupy or privilege, but the circuit they take between the functions. Traditional music training moves from the objective listening of *comprendre* and *écouter* to deduce the subjective, while experimental music research begins from the subjective levels of *entendre* and *ouïr* to induce the objective.

The homology Schaeffer sets up between the two disciplinary configurations privileges a synchronic viewpoint. This allows Schaeffer to put the treatise forward not only as an authentic basis for the production of 'musics to be invented', but a means of comparison between any disparate musical traditions.[162] A diachronic comparison, for Schaeffer, presumes that other traditions must progress inevitably towards the Western system of melodico-harmonic relations. This is mistaken, he claims, because it wrongly identifies tonality as the fundamental structure of Western music. Instead, Schaeffer proposes to take all traditions as equally contemporary, not ordered in a succession from primitive to advanced, but equally invested in the fundamental structures revealed by the discovery of the listening functions and the sound object. The listening functions are thus not the achievement of a particular kind of musical thinking, but the 'common trunk' of all musics, agnostic to the particular 'dominant perceptions', 'families' of sounds, and musical 'values' that human musics might privilege.[163] Taking issue at once with Theodor Adorno's dismissal of psychology in *Philosophie der neuen musik*, and with serialist attempts to innovate at the level of musical codes, Schaeffer suggests that the goal of musical research is thus to abandon prescriptive schemas altogether in favour of a deeper understanding of music's basis in consciousness. The result should be a multiplication of musical difference, not only at the level of code, but also in the elementary materials and meanings music engages.[164]

162Ibid, 602-3.
163Ibid, 603-4.
164Schaeffer, *Traité*, 627-9; cf. Adorno, *Philosophy of Modern Music*, 23-4.

We need to be cautious about the amount of structuralist ambition we read into Schaeffer's project. Proponents of a systematic semiology of music like Jean-Jacques Nattiez and Jean Molino treated Schaeffer as a little more than a precocious amateur, acknowledging his insight into the mounting crisis of musical legitimacy instigated by the avant-garde and its technologies, but dismissing his core concepts as confused and misdirected.[165] As Carlos Palombini has argued, the combination of phenomenological and structuralist influences in the treatise is an 'invitation to a generous misreading'.[166] But it is unfair to presume that Schaeffer's theoretical ambitions were unrealized simply because they were eclectic. The period in which Schaeffer worked has been described by Eve Kosofsky Sedgwick and Adam Frank as 'a fold between modern and postmodern ways of hypothesizing about the brain and mind'.[167] The idea that human cognition was a sort of computer had just appeared on the horizon, but without the technology to model it in any useful way, researchers found themselves free to speculate about how the 'software' of consciousness might operate. In this regard, Schaeffer's project was very much of its time. But this reading also brings new inconsistencies to the fore.

In reducing the sound object to its perceptual correlates, and formalising the production of meaningful sonic relations as a commonly-held 'structure of perception', Schaeffer leaves little room for a positive account of musical inscription. This logocentrism, to borrow Derrida's term, absorbs the influences of both Husserl and Saussure to downgrade writing to an act of violence against human expression. Since acoustic vibration is already a mediation for Schaeffer, notation can be cast aside as exterior and instrumental.[168] Musical forms shaped by notation become pathological. Sound recording, which provides the basis for both reduced listening itself, and for intersubjective consensus between listeners, does not at first appear to count for Schaeffer as a form of inscription.

165See Jean Molino, 'Musical Fact and the Semiology of Music', trans. J.A. Underwood, *Music Analysis*, 9, (1990), 105–56 at 120-4; Nattiez, 'Le statut sémiologique de l'objet sonore'. It should be noted, in fairness, that this generation also found serious fault with the theories of the serialists. See Grant, *Serial Music, Serial Aesthetics*, 206-17.

166Palombini, 'Pierre Schaeffer's Typo-Morphology of Musical Objects', 58.

167Eve Kosofsky Sedgwick and Adam Frank, 'Shame in the Cybernetic Fold: Reading Silvan Tomkins', *Critical* Inquiry, 21 (1995), 496–522 at 508–9.

168Derrida, *Of Grammatology*, 35-8.

Having reached a certain 'level of fidelity', the function of the apparatus changes from 'reproduction' to 'reconstitution', allowing the listener to shape sound directly as sound instead of as the result of a mediating process.[169] So again, Schaeffer insists upon a logocentric understanding of musical mediation. The machine becomes a transparent prosthesis to the listener's internal selection mechanism, which Schaeffer privileges as the universal source of musical meaning. Similarly, Schaeffer's listening functions leave no space for a situated, embodied listener. Bodies, desires, and identities are completely evacuated along with their sometimes turbulent social and political conditions. Like the psycho-acousticians in Jonathan Sterne's account of 'perceptual technics', and contrary to his reputation as an empiricist, Schaeffer conducted his research as if he were investigating human listening as such, not in the interest of finding out about any listener's actual experiences.[170] There is no account of pleasure or power,[171] and since Schaeffer misreads Saussure's *langue-parole* distinction as an analogue of his own distinction between the abstract and the concrete, there is no proper place for the consideration of differences in performance or competence.[172] In this respect Schaeffer's theory again suffers from the same faults as his structuralist contemporaries, failing to encompass any means of resistance to the polarized order of functional relations.[173]

Conclusion

Schaeffer's colleagues at the GRM seem have to have found the tenets of the treatise less accessible on the page than in practice. 'The TOM [i.e. *Traité des objets musicaux*] is ... a reservoir of provisional ideas to be called into question', explains François Delalande in a 1976 colloquium

169Schaeffer, *Traité*, 83-4. Schaeffer seems to have developed this view early in his work on radio. See Palombini, 'Technology and Pierre Schaeffer'; Pierre Schaeffer, *Essai Sur La Radio et Le Cinéma : Esthétique et Technique Des Arts-Relais 1941-1942*, ed. Carlos Palombini and Sophie Brunet (Paris, 2010).

170Jonathan Sterne, *MP3: The Meaning of a Format* (Durham, 2012), 55–60. Schaeffer is unequivocal in attaching his account to the generalising category of 'man'. Schaeffer, *Traité*, 641.

171Cf. Roland Barthes, 'Écoute', in *L'Obvi et l'obtus : essais critiques III* (Paris, 1982), 217–30.

172Schaeffer, *Traité*, 305-7 and 314.

173For a similar critique of structuralist semiotics see Julia Kristeva, 'The System and the Speaking Subject', in *The Kristeva Reader*, ed. Toril Moi (Oxford, 1986), 24–33.

collecting views on the book's immediate legacy.[174] Bayle is more critical: 'TOM is an edifice constructed in a desert, and we must salute it as such, but it was not nourished by its author. Once it was written, Schaeffer let it fall. That's why this difficult concept [of the object], separated from its operational aspect, has fallen behind.'[175] Quite early on, then, consensus seems to have decided that Schaeffer's work should be treated more as a spur to creative invention than a rigorous analytical system. 'As it was for [Marx's] *Capital*', speculates Malec, 'nobody will read the treatise. It will be the least read book, but it may incidentally be the most used.'[176]

Writing in the same volume, Schaeffer seems in part to accept this fate, describing his book self-deprecatingly as the 'appraisal of an incomplete research'.[177] But the unanswered question of a compositional system sufficient for the 'operational' goals of the GRM is, for Schaeffer beside the point. 'I have tirelessly warned composers and researchers', he writes, 'against an all too common temptation given the general uncertainty: to want to found, on sonic criteria, a musical organization; to want to deduce, from the knowledge of objects, that of the structures that would arise, in fact, from a complementary research.'[178] Schaeffer continued to assert that his primary achievement was not the invention of a particular music by manipulating sounds in the studio, but rather the provision of a basis for understanding all musics as enmeshed in the structure of sonic experience.

> Beginning from the objets given to perception and the properties of the perceptual field, it is thus logical to predict, among the many possible musics, differences more radical still than between, say, figurative painting and abstract painting. […] The presence of sound and the occupation of duration open onto many domains. Music is plural.[179]

Most anglophone scholars still take Schaeffer's treatise at face value as a philosophy of 'concrete' composition, in spite of the fact that Schaeffer claimed to be neither a philosopher nor, paradoxically, a committed proponent of *musique concrète*. As I have shown, however, such a

174François Delalande, 'Ce que le G.R.M. pense du T.O.M.', *Cahiers recherche/musique*, 2 (1976), 27–33 at 27.
175Ibid, 29.
176Ibid.
177Pierre Schaeffer, 'La musique par exemple (positions et propositions sur le Traité des objets musicaux)', *Cahiers recherche/musique*, 2 (1976), 55–72 at 55.
178Ibid, 59.
179Ibid, 64.

reading brackets the treatise's historical context, its intertextual associations, and its *mise en pratique*. Instead, we should heed Schaeffer's advice to strike the right balance between making and listening. From this more holistic perspective, Schaeffer's research programme offers an experimental interdiscipline attuned to the rediscovery of human auditory experience as a basis for knowledge about music in general. While it may suggest guidelines for the invention of new musical languages, it does not do so exclusively. Its primary concern is with providing an ethical account of the substance of musical consciousness itself: 'We have tried to describe [...] the birth of unconscious musical systems, forged simultaneously by practice and auditory training, which makes the members of a musical civilization so skilled at recognising the pertinent traits (those that play a role in structure), at the time time that it makes them practically deaf to the non-pertinent traits. […] We can now better measure the strength of this training, and all the apprenticeship we need to unlearn it, and hear the music of others.'[180] Indeed, the use of the treatise has not been limited to the acousmatic tradition. We might extend some credit to Schaeffer for helping to spark the spectralist movement, for instance, not only for his deep interest in timbre, but also for his performative stance as a theorist of musical and cultural pluralism.[181]

This places Schaeffer much closer to present-day musicological concerns than his followers normally acknowledge. Using the conceptual tools at his disposal, Schaeffer sought not to establish a single, correct musical knowledge, but to understand and democratize the means of producing musical knowledge. In this regard his work can easily be read as part of the long line of cybernetically-inspired musical humanists insisting on the unpredictability of musical expression, its continuity with language and other forms of sonic gesture, and the entanglement of the researcher in the inductive study of musical knowledge.[182] Many aspects of Schaeffer's ethical message would reemerge decades later, albeit largely stripped of their speculative structuralist

180Schaeffer, *Traité*, 288.
181Cf. Drott, 'Spectralism, Politics and the Post-Industrial Imagination'.
182See for example John Blacking, *How Musical Is Man?* (Seattle, 1973); Christopher Small, *Music Society Education* (New York, 1977); Steven Feld, *Sound and Sentiment: Birds, Weeping, Poetics, and Song in Kaluli Expression* (Philadelphia, 1982).

formalities, in the guise of 'postmodern', 'decentered', or 'relational' musicologies, attuned to the substance of musical mediation and difference.[183] Of course, Schaeffer did not arrive at the kind of interdisciplinary 'agonism' argued for by Georgina Born, for example, nor did he discover any useful way of moving beyond an immediate and highly schematic picture of the listening experience to account for music's wider social conditions. But he did recognize that understanding musical experience in its diversity required an epistemological and ontological break with cloistered formalisms, and that achieving such a break meant questioning the normative hierarchies that measure musical knowledges on scales of technical or material sophistication.

The treatise achieves this advance, however, by granting the individual listener complete proprietary power over the production of musical meaning. In this regard Schaeffer falls neatly into the 'early sound studies' paradigm identified by Benjamin Steege with regard to the work of R. Murray Schafer, 'preoccupied with cordoning off, naturalization, or intensive policing of a specific difference of the aural'.[184] Both Ian Biddle and Peter Szendy have identified Schaeffer's theory with the emergence of individualized modes of musical reception under late capitalism.[185] Recording technology, according to Szendy, allows us to make music of our listening itself, and thus to exchange our listenings with others. But in Schaeffer's model, the perceptual structure underlying listening is innate and universal. While there may be many musics, there is only one, universal set of listening functions. Schaeffer's operative distinction between nature and culture—the natural being chaotic and permanent, while the cultural is normative and contingent[186]—pushes the listening functions into a transcendent position. So while plurality is accepted as primary, the listener becomes like Latour's 'modern anthropologist', severing any deeper links with exotic nature-

183Lawrence Kramer, *Classical Music and Postmodern Knowledge* (Berkeley, 1996); Kevin Korsyn, *Decentering Music: A Critique of Contemporary Musical Research* (Oxford, 2003); Georgina Born, 'For a Relational Musicology: Music and Interdisciplinarity, Beyond the Practice Turn', *Journal of the Royal Musical Association*, 135 (2010), 205–43; Nicholas Cook, 'Anatomy of the Encounter: Intercultural Analysis as Relational Musicology', in Stan Hawkins (ed.), *Musicological Reflections: Essays in Honour of Derek B. Scott*, (Farnham, 2012), 193–209.

184Benjamin Steege, 'Acoustics', in *Keywords in Sound*, ed. David Novak and Matt Sakakeeny (Durham, 2015), 22–32 at 28.

185Peter Szendy, *Listen: A History of Our Ears*, trans. Charlotte Mandell (New York, 2008), 94; Biddle, 'Listening, Consciousness, and the Charm of the Universal.'

186Chion, *Guide*, 36–7.

cultures.[187] Indeed, the interrelated complexes of sound objects and musical structures that the listening subject constitutes need to transcend nature and culture in order to be truly universal, and thus music itself becomes a kind of 'supplement' to the division.[188] Schaeffer makes no attempt to address this issue by questioning the dialectical history of the nature-culture binary in music, for example, or by trying to conceive of a common ground beyond the individual mind that could encompass the variety of musics and listenerships as a real plurality. Thus Schaeffer's interdiscipline falls short of recent attempts to rethink the composition of cultural polities along 'equivocal' lines of material difference.[189] He does not equip us with the tools to 'hear the *hearing* of others', as Jonathan Sterne suggests should be the goal of sound studies.[190] While he is prepared to embrace and defend plurality at the level of musical experience and expression, he still sees the diversity of cultures as a kind of veil concealing the absolute reality of shared perceptual structures. His faith in universal structures of consciousness overrides any intuition about the volatilities or differences in experience.[191]

In many ways, however, Schaeffer's listener also undermines this reductive humanism. Vehemently resistant to deductive reasoning as to the content of experience, Schaeffer largely abstracts the subject from liberal notions of sovereignty or self-interest. Understood relationally as a system of attentional circuits, Schaeffer's listening functions need no correlation with states of self-reflection; they are simply encounters between a pre-personal listening machine and a field of sonic intensities. While the treatise portrays recording technologies as an instrumental extension of listening, the relationship could easily be formulated the other way around. There is no natural listening prior to cultural techniques.[192] What Schaeffer leaves us with is thus a series of open-ended challenges: to multiply the methodological possibilities for music and sound studies; to complicate

187Bruno Latour, *We Have Never Been Modern* (Cambridge, 1993), 97-100; cf. Schaeffer, *Traité*, 41–50.
188This is also one of Derrida's primary criticisms of Lévi-Strauss. See Derrida, 'Structure, Sign, and Play', 282–4.
189See for example William Connolly, *Pluralism* (Durham, 2005), 68-92; Eduardo Viveiros de Castro, 'Perspectival Anthropology and the Method of Controlled Equivocation', *Tipití: Journal of the Society for the Anthropology of Lowland South America*, 2 (2004), 3–22.
190Jonathan Sterne, 'Hearing', 74 [my emphasis].
191Schaeffer, *Traité*, 603-5.
192Sterne, 'Hearing', 69. Veitl, for example, emphasises the role of new technologies in engendering the notion of music research as such. Veitl, *Politiques*, 12.

our understanding of what is 'human' in technologically mediated musical behaviour; and to attend more closely to the entanglement of bodies, disciplines, cultures, and machines in listening experience.